

TWO NEW SPECIES OF VERBESINA (COMPOSITAE)
WITH TAXONOMIC NOTES ON OTHER SPECIES

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While working on a revision of the genus *Verbesina*, I encountered two previously undescribed species of section *Pterophyton* which are described herein. In addition, a confused taxonomic situation was discovered and is reported. This is part of a Ph.D. thesis submitted to Indiana University. This work was supported by fellowships from the National Science Foundation and Indiana University and I wish to express my gratitude to Charles B. Heiser who suggested this study and read the manuscript.

Verbesina apiculata Coleman, sp. nov. Type: Ocurachui, Sierra Surotato, Sinaloa, Mexico, *Gentry 6263* (NY!).

Herb erecta perennis ca. 0.7 m alta; caulis anguste alatus; folia alterna sessilia lanceolate-oblonga vel linearia acuta vel acuminata usque ad 8 cm longa scabra; inflorescentia corymbosa capitulis 5–6 ca. 2 cm latis praedita; phyllaria ca. 2-seriata suboblonga ca. 3.5–4.0 mm longa; radii ca. 8 styliferi; receptacula convexa; paleae acutae vel apiculatae; achenia immatura obovata ca. 3 mm longa anguste alata pappi aristis 2 ca. 0.8 mm longis praedita.

Erect herbaceous perennial ca. 70 cm tall; stems to 3 mm in diameter, puberulent, winged to near the inflorescence (wings to 1.5 mm wide); leaves alternate, sessile, lance—oblong to linear, serrate to serrulate, acute to acuminate, to ca. 8 cm long, ca. 1.0–1.7 cm wide, scabrous above, hispid beneath, pinnately veined; peduncles to ca. 10 cm long; inflorescences corymbose, heads 5–6, ca. 2 cm wide; phyllaries ca. 2—seriate, oblong to subspatulate, ca. 3.5–4.0 mm long, obtuse or acute, black, some with tips recurved; ray florets ca. 8, styliferous, linear, ca. 1.7 cm long, hirtellous, awnless; disc florets ca. 7 mm long, corolla sparingly hirsute, ovary ca. 2.5 mm long, upwardly hirsute, awns ca. 0.8 mm long, style tips attenuate; receptacle convex; chaff ca. 5.5 mm long, hirsute, acute or apiculate, black apically; disc achenes (immature) obovate, ca. 3 mm long, 1.5 mm wide, the crown with a slightly thickened ridge, the wings ca. 0.2 mm wide, the margins ciliate, the awns 2 ca. 0.8 mm long, (fig. 1).

Verbesina apiculata is known only from the type material which the collector states as having been collected at about 6000–7000 feet in a pine forest area in a steep, moist, shady canyon with mixed dominants. The closest affinities of *V. apiculata* are with *V. rosei* from which it differs by its alternate, scabrous leaves and black phyllaries as well as by its styliferous ray florets. The leaves of *V. rosei* are opposite and strigillose. *Verbesina rosei* occurs about 350 miles SSE of the type locality of *V. apiculata* in the state of Nayrait.



FIG. 1. *Verbesina apiculata*: A, habit sketch, \times ca. $\frac{1}{3}$; B, ray floret, \times 4.5; C, chaff, \times 7; D, disc floret, \times 7.5.

Verbesina tequilana Coleman, sp. nov. Type: rocky hillsides, Tequila, Jalisco, Mexico, *Palmer 377* (NY!, isotype, NY!).

Herba erecta perennis; caulis alatus usque ad capitulum; folia plerumque opposita sessilia elliptica acuta ca. 5–8 cm longa penninervia scabra; capitulum ca. 4.5 cm latum; phyllaria 2–3—seriata oblonga ca.

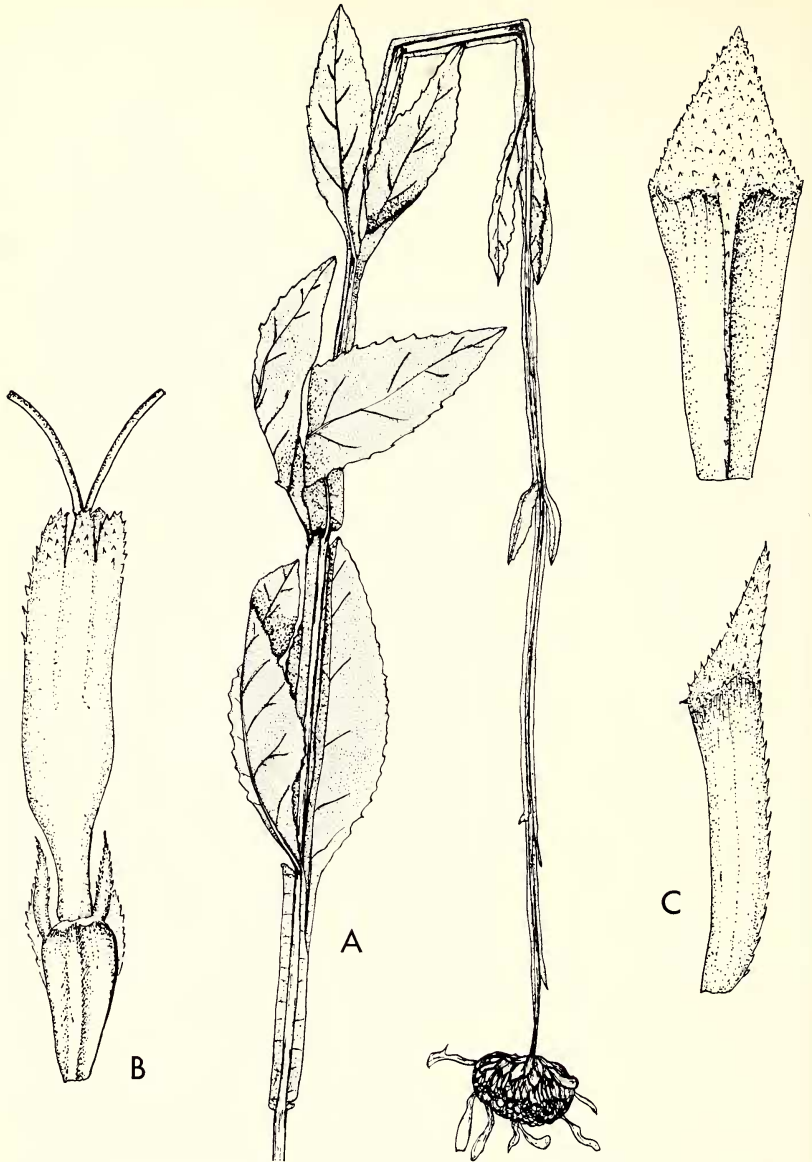


FIG. 2. *Verbesina tequilana*: A, habit sketch, \times ca. $\frac{1}{3}$; B, disc floret, \times 5.5; C, chaff, \times 5.

5–8 mm longa marginibus revolutis praedita; radii ca. 10 styliiferi; ovaria ca. 4 mm longa pappi aristis 2 ca. 1.5 mm longis praedita.

Erect herbaceous perennial exceeding 1 m. tall; stems to 3 mm in diameter, winged to the heads (wings ca. 2.5 mm wide), sparingly

hirsute; leaves mostly opposite, becoming alternate above, sessile, elliptical, serrate, acute, ca. 5–8 cm long, ca. 2.5–4.0 cm wide, quite scabrous, pinnately veined; peduncles ca. 2 cm long; inflorescences 1–2—headed, heads ca. 4.5 cm wide, discs ca. 2 cm wide; phyllaries 2–3—seriate, oblong, obtuse, margins revolute, the outer series ca. 5–7 mm long, the inner series ca. 8 mm long; ray florets ca. 10–12, styliiferous, ca. 1.7 cm long, corolla sparingly hirsute, oblong, ovary ca. 2.5 mm long, awnless; disc florets ca 11 mm long, style tips attenuate, ovary ca. 4 mm long with marginal wings developing, the awns 2 ca. 1.5 mm long; chaff ca. 7–8 mm tall, acute (fig. 2).

Verbesina tequilana is known only from its type material which unfortunately lacks achenes. It is quite closely allied to *V. tetraptera* (Orteg.) Gray from which it is distinguishable by its sessile, elliptical, pinnately veined leaves and its fewer (ca. 10–12 vs. 15–25) and styliiferous ray florets. The generally rhomboid-hastate leaves of *V. tetraptera*, although varying greatly in shape, never approach being elliptical and are always distinctly petiolate and strongly triple nerved. The type locality of *V. tequilana* is approximately 200 miles NW of the known range of *V. tetraptera*.

The type of *V. tequilana* was referred by Robinson and Greenman (1899) to *V. scabra* Benth. which they placed in section *Alatipes*. They considered the specimen as being “surely distinct from *V. tetraptera*” and identified it with Bentham’s description and a drawing by Klatt. However an examination of an isotype and a photograph of the holotype permits no doubt of that species’ being identical with *V. tetraptera*. Blake (1930), commenting on this situation, said of *Palmer 377*, “it may represent a distinct species.” However he failed to describe it as such.

In their introduction to section *Pterophyton* Robinson and Greenman (1899) refer to *V. ovata*, but do not mention the name further except as a synonym of *V. pterocaula* (Moc. & Sess.) DC. to which they refer Delessert t. 597 and *Seaton 340*. A comparison of a photograph of Delessert’s drawing of *Mociño* and *Sessé 30728* with *Seaton 340* revealed that the two are certainly not of the same species. *Mociño* and *Sessé*’s specimen is depicted as having styliiferous ray florets, the ovaries bearing two well developed awns. Also, the leaves are linear-lanceolate with acuminate tips. *Seaton 340* contrasts with this by having neutral ray florets, the ovaries of which are awnless, as well as by having acute or obtuse, oblong or elliptic-oblong leaves. *Seaton 340* fits well enough the description and illustration of *Coreopsis ovata* Cav. which Gray later correctly transferred to *Verbesina*. Robinson and Greenman erred in applying the name *V. pterocaula* (Moc. & Sess.) DC. to *Seaton 340* rather than *V. ovata* (Cav.) Gray and in citing the two specimens together.

Verbesina pterocaula is however a legitimate species which fits well into section *Verbesinaria*. A comparison of *Mociño* and *Sessé 30728* with the type of *V. stenophylla* Greenman. (*Pringle 6503*), which Robinson

and Greenman placed in section *Verbesinaria*, revealed no significant differences. Since *V. pterocaula* has priority, it is necessary that *V. stenophylla* be reduced to a synonym of that species.

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OBSERVATIONS ON WITCHES'-BROOM FORMATION, AUTOPARASITISM, AND NEW HOSTS IN PHORADENDRON

FRANK G. HAWKSWORTH AND DELBERT WIENS

During the course of field studies on *Arceuthobium* in the southwestern United States and Mexico, we also had the opportunity to make a number of collections of the related genus, *Phoradendron*. This report is a compilation of our observations on *Phoradendron*, including witches'-broom formation, autoparasitism, and some new hosts.

This research was supported, in part, by a cooperative agreement between the Rocky Mountain Forest and Range Experiment Station and the University of Colorado where the junior author was located during the conduct of the study. Herbaria abbreviations used here but not occurring in *Index Herbariorum* include: FPF—Forest Pathology Herbarium, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado, and INIF—Instituto Nacional de Investigaciones Forestales, Mexico, D.F.

WITCHES'-BROOMS

Witches'-broom formation is a common symptom of conifers infected by *Arceuthobium*, but has not been reported previously to be associated with parasitism by *Phoradendron*. The only other reported instance of witches'-brooms caused by a member of the Loranthaceae is in Chile where brooms are induced by *Phrygilanthus tetrandrus* Eichler on *Populus* (Reiche, 1907; Kuijt, 1964). This report is verified (fig. 1) from collections made in Santiago, Chile (*Wiens 3833 UT*). Brooms in *Populus* consisted of masses of vertical branches that rose 5 to 10 ft. No broom formation was observed on native hosts attacked by this mistletoe.